MISC. PUB. NO. 18

FOREST INSECT CONDITIONS in the INTERMOUNTAIN & NORTHERN ROCKY MOUNTAIN STATES DURING 1958

INTERMOUNTAIN FOREST & RANGE EXPERIMENT STATION
REED W. BAILEY, DIRECTOR

FOREST SERVICE
U. S. DEPARTMENT OF AGRICULTURE

OGDEN, UTAH MARCH 1959

Misc. Pub. No. 18 March 1959

FOREST INSECT CONDITIONS
IN THE INTERMOUNTAIN AND NORTHERN ROCKY MOUNTAIN STATES
DURING 1958

By

Division of Forest Insect Research

INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION
Forest Service
U. S. Department of Agriculture
Ogden, Utah
Reed W. Bailey, Director

COVER PHOTO

Helicopter discharging survey crewman on 10,100 foot ridge in lodgepole pine area. Use of helicopter permitted survey activity before roads were in condition for travel.

FOREST INSECT CONDITIONS IN THE INTERMOUNTAIN AND NORTHERN ROCKY MOUNTAIN STATES DURING 1958

Entomologists of the Intermountain Forest and Range Experiment Station collected and coordinated information gained during the annual forest insect survey of 1958. Participation in the program by personnel in other Federal and State land-managing agencies, forest industries, and interested private landowners is gratefully acknowledged. Cooperative action resulted in more effective coverage than would otherwise have been possible.

With aircraft based at Missoula, Boise, and Ogden, a program of aerial observation of forested areas was carried on. It was not possible to survey all forested areas during 1958 but it is doubtful that any serious infestation escaped detection. Ground surveys were performed wherever observation or reports indicated that insect populations were reaching serious levels.

In general, insect outbreaks in the Intermountain States showed a decided increase, notably because of increased activity by mountain pine beetle and Engelmann spruce beetle. Conditions in the northern Rocky Mountain States did not worsen noticeably over those reported for 1957.

Numerous forest insect situations in the area covered by the surveys are serious. Control action is under way against widely scattered outbreaks throughout the area. This report presents the status of both major and less important forest insects for 1958.

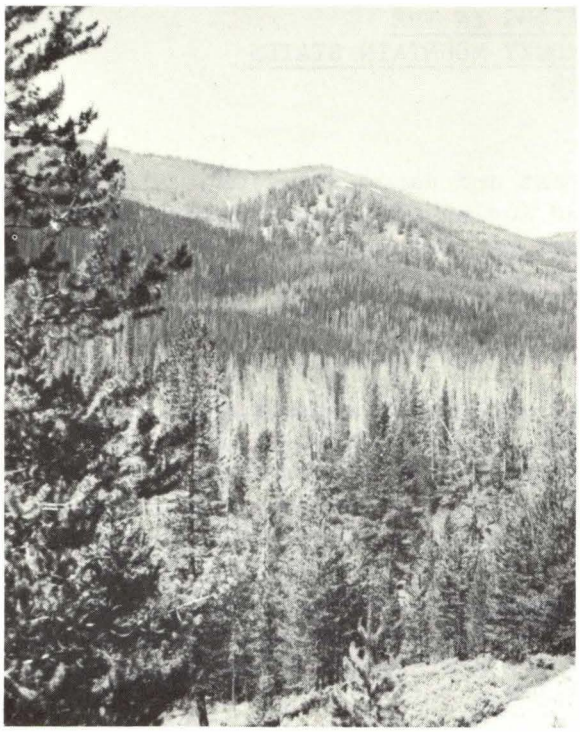
BARK BEETLES

MOUNTAIN PINE BEETLE

Dendroctonus monticolae Hopk.

During 1956 populations of mountain pine beetle in lodgepole pine were increasing in parts of Utah, southern Idaho, and western Wyoming. Surveys in 1957 showed continuing evidence of this increase. Records obtained in 1958 cause considerable concern over the upward trend that was obvious from aerial and ground observations.

An extensive outbreak on the Wasatch National Forest in Utah continues. This particular epidemic is not new but has fluctuated at rather high levels since 1950. During the past few years it has increased areawise as well as in intensity. A large-scale control program was started in 1958 to prevent further spread and reduce populations as progress is made from the edges into the main body of infestations. As many as 89,000 trees may be currently infested. On the Ashley National Forest, control efforts continue in centers first reported last year.



Lodgepole pine snags, result of mountain pine beetle attack

Mountain pine beetle infestations on Grand Teton National Park in Wyoming and on the adjoining Teton National Forest still threaten extensive lodgepole pine stands. Control projects in infestation centers have reduced populations of beetles, but new groups of infested trees are found in the same general areas. The most recent discovery was of two major infested areas on the Targhee National Forest that are in the general area of the large-scale Targhee-Teton outbreak of the late 1940's. The Sawtooth National Forest in southern Idaho is also the site of an outbreak of mountain pine beetle that has developed in severity for several years. The well-defined trends toward increasing populations in Utah, western Wyoming, and southern Idaho demand increased vigilance in lodgepole stands. In Montana, the mountain pine beetle in lodgepole persists in Glacier National Park in several stands, but the general level of the outbreaks decreased somewhat between 1957 and 1958.

The mountain pine beetle in old-growth white pine stands in northern Idaho continues to kill significant volumes each year. Biological evaluations and past records indicate that populations kill between 1 and 2 percent of the numbers of trees in these old-growth stands.

Treatment of a mountain pine beetle infestation in second-growth ponderosa pine on the north shore of Lake Tahoe in Nevada was undertaken in 1958. This infestation has been present and recorded for the past few years. By salvage-logging and the cutting and burning of unmerchantable material, this infestation has been reduced. The operation was not complete and additional infested trees were located late in the season.

A small but threatening outbreak of mountain pine beetle in approximately 150 trees was located in second-growth ponderosa pine on the Boise National Forest in Idaho. Since mountain pine beetle can be a serious pest in these second-growth stands, immediate steps were taken to fell and destroy the infested trees.

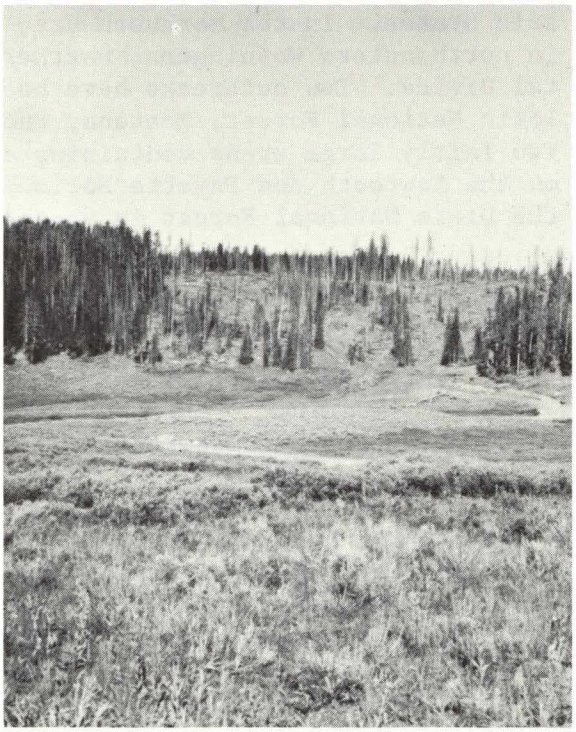
ENGELMANN SPRUCE BEETLE

Dendroctonus engelmanni Hopk.

Remnants of the 1952 destructive outbreak of the Engelmann spruce beetle persist in some of the national forests of Montana, particularly in the Flathead and Kootenai Forests. Logging is directed into these areas to remove infested material and further reduce populations.

An infestation of spruce beetle, which apparently developed in windfelled spruce, was discovered during 1958 in the Beartooth Primitive Area of the Custer National Forest in Montana involving a gross of 4,500 acres.

A striking increase in Engelmann spruce beetle occurred during 1958 in Utah. The most serious epidemic covers about 100 square miles (gross area) of spruce type where the Wasatch, Ashley, and Uinta National Forests join. It was estimated that more than 55,000 trees were infested when the area was first surveyed. Control action was started through logging of infested stems plus treatment of infested slash and stumps.



Extent of spruce beetle damage revealed by removal of dead and infested trees

Another serious outbreak developed on the Manti-LaSal National Forest and adjoining State and private lands in southeastern Utah. The number of trees was estimated at 13,500. Control action was taken immediately.

A lesser outbreak involving about 3,000 infested trees was discovered on the Dixie National Forest. The infestation was in a sale area and most of the trees were either logged or treated during the season.

A relatively small, but intense, outbreak developed in 1958 on the Payette National Forest in Idaho. This outbreak threatens considerable spruce in the area.

The outbreak on the Bridger National Forest in Wyoming that has been active for the past 3 years continues. Control work has reduced the populations but in some portions of the area the species is still killing considerable volumes of spruce.

DOUGLAS-FIR BEETLE

Dendroctonus pseudotsugae Hopk.

For the past several years the Douglas-fir beetle has been at a relatively low level. During 1958 a distinct upward trend was noted in Douglas-fir stands in the northern Rocky Mountain area and in the Intermountain States. In the northern area most outbreaks are in scattered locations in northeastern Washington, northern Idaho, and Montana west of the Continental Divide. Two outbreaks have been reported east of the divide on the Gallatin National Forest, Montana, and in Yellowstone National Park, Wyoming. Two fairly large areas containing approximately 600 trees each were located on the Sawtooth and Payette National Forests in Idaho. An older outbreak on the Dixie National Forest in southern Utah continues at a high level.

WESTERN PINE BEETLE

Dendroctonus brevicomis Lec.

Mortality of ponderosa pine caused by western pine beetle remains at a low endemic level. Most infested trees occur singly and widely scattered throughout old-growth pine stands.

LODGEPOLE PINE BEETLE

Dendroctonus murrayanae Hopk.

Small outbreaks of the lodgepole pine beetle have been reported in lodgepole pine stands in the Gallatin National Forest in Montana. Beetle attacks appear to be confined to trees with previous top injury caused by porcupine feeding and bole attacks of an undetermined pitch moth.

BLACK HILLS BEETLE

Dendroctonus ponderosae Hopk.

An outbreak of Black Hills beetle that has been active on the Dixie National Forest and Bryce Canyon National Park in southern Utah since 1950 shows a downward trend. Control projects have been carried out each year, yet new centers have appeared in other areas. In 1958 surveys indicated a decided reduction in numbers of infested trees with the exception of one area.

SOUTHWESTERN PINE BEETLE

Dendroctonus barberi Hopk.

The southwestern pine beetle continues to kill ponderosa pine on the heavily used recreational areas of Charleston Mountain near Las Vegas, Nevada. The rate of loss has been reduced by maintenance control throughout the active season, but it appears that this treatment will be necessary as long as the present trend of the infestation continues.

DEFOLIATORS

SPRUCE BUDWORM

Choristoneura fumiferana (Clem.)

The spruce budworm continues to be a serious defoliator in Montana, Wyoming, and Idaho. The net acreage of infestation in the northern Rocky Mountain area is approximately 2.9 million acres, part of which is in Yellowstone National Park. In southern Idaho about 820,000 acres show noticeable defoliation. While the infestations in southern Idaho have increased areawise each year since 1952, surveys in 1958 showed that for the first year there was no general increase in severity of damage. The most serious conditions exist on the Salmon National Forest bordering Montana.

BLACK-HEADED BUDWORM

Acleris variana (Fern.)

Fairly widespread infestations of black-headed budworm, reported in 1956 and 1957, subsided in 1958 to a single infestation on the Kootenai National Forest in Montana. Here damage to western hemlock host stands, as observed during aerial survey, was hardly visible. The 1958 Kootenai infestation covers approximately 1,500 acres. Known infestations of this budworm in 1956 and 1957, mostly on the Kootenai Forest, Montana, and the Kaniksu National Forest, Idaho, subsided from natural causes late in 1957.

Approximately 50,000 acres of lightly defoliated alpine fir were located this year. This defoliation occurred in the high altitude ridge tops and was caused by black-headed budworm.

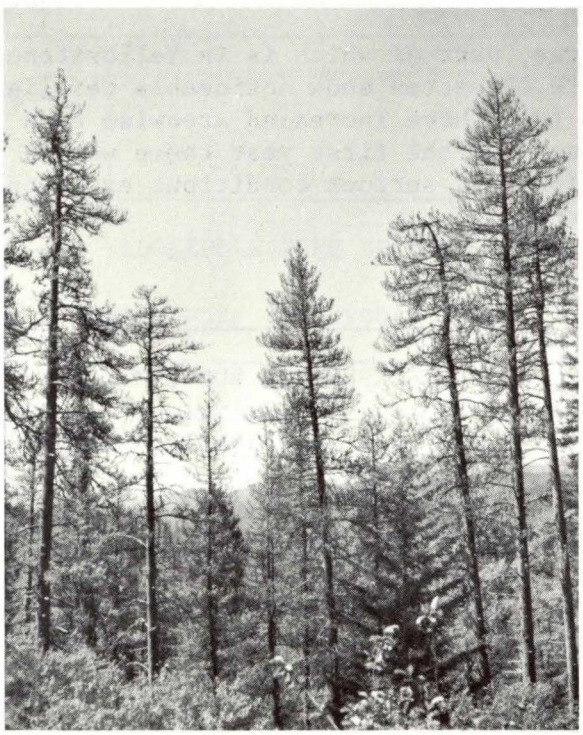
PINE-FEEDING BUDWORM

Choristoneura lambertianae (Busck)

A small outbreak of the pine-feeding budworm was reported in 1957 from lodgepole stands near Missoula, Montana. Populations of the budworm were plentiful enough in 1958 for collection purposes, but the damage to the foliage was not significant. Although this infestation is the only extensive one in the northern Rocky Mountains, individual specimens of this insect were collected in 1958 from Pinus ponderosa var. scopulorum Engelm. from the Long Pines section of the Custer National Forest on the Montana-South Dakota State line; also from ponderosa pine on the Helena National Forest, Montana.

PINE BUTTERFLY

Neophasia menapia (F. & F.)



Ponderosa pine defoliated by pine butterfly

Each year since the spray operation in 1954 to control pine butterfly, special attention has been given to relative abundance of adult pine butterflies in ponderosa stands in Idaho. During aerial surveys on the Salmon National Forest, sufficient numbers of adults were seen to warrant egg examinations. These examinations showed that approximately 50,000 acres of ponderosa pine were supporting a noticeable population. Egg surveys revealed about seven eggs per twig within the center of the area to less than one along its edges. An average of nine or more eggs during sampling is considered an indication of epidemic conditions. Defoliation observed was light, but occasional heavily defoliated trees were seen. There appeared to be a fairly high population of Theronia atalantae (Poda.), a parasite of the pine butterfly, for this stage of development of an outbreak.

DOUGLAS-FIR TUSSOCK MOTH

Hemerocampa pseudotsugata McD.

During 1957, planning was started for an aerial spray project to control Douglas-fir tussock moth in Owyhee County in southern Idaho. Observations and collections late in the season indicated that a virus disease was quite common within the population. It was then decided to cancel all plans for spraying. Surveys in 1958 revealed that the virus disease had practically eliminated the outbreak.

RUSTY TUSSOCK MOTH

Orgyia (Notolophus) antiqua (L.)

An epidemic of rusty tussock moth was reported in 1958 on 1,500 acres of shrub vegetation near West Yellowstone, Montana. Some subalpine fir foliage also showed evidence of feeding in this area. A study of moth cocoons from the area showed that there was a ratio of one 1958 egg mass to nine 1957 or older egg masses. This indicates that the infestation has declined rapidly this year.

TUSSOCK MOTH

A tussock moth, in epidemic numbers, was found feeding on bitterbrush, willow, wild rose, and desert peach on the foothill ranges between Carson City and Reno, Nevada. By the end of the active feeding period (last of June) the valuable bitterbrush was nearly 100 percent defoliated over the 40 acres inspected. The exact extent of the outbreak was not determined, but probably much of the foothill range between Carson City and Reno supported epidemic populations of tussock moth. Quite possibly other bitterbrush ranges in western Nevada and eastern California were subjected to defoliation by this tussock moth.

Severe defoliation of bitterbrush can be very detrimental since it removes the palatable forage that supports large numbers of deer. Repeated defoliation may eventually cause mortality to some of the browse plants. To date the species of tussock moth involved in this range problem has not been determined.

LODGEPOLE PINE NEEDLE MINER

Recurvaria milleri Busck

The lodgepole needle miner is now in epidemic numbers throughout most of the Cassia Division of the Sawtooth National Forest in Idaho, and a small infestation (about 1,500 acres) has appeared west of Gerrit in the center of the extensive lodgepole pine stands of the Targhee National Forest. The previous outbreak that died out in 1953 covered much of the Sawtooth, Caribou, and Targhee National Forests.

PINE TIP MOTH

Rhyacionia sp.

Severe damage from a pine tip moth caused considerable damage to natural reproduction of ponderosa pine, Pinus ponderosa var. scopulorum Engelm., on the Long Pines section of the Custer National Forest, Montana. Similar infestations have also been reported in other parts of the Sioux Division of the Forest. The damage is heavy in spots and covers considerable area. The infestation has apparently persisted for several years, and similar infestations were reported from this area as early as 1936. Efforts this season to obtain living specimens of the tip moth for determination were unsuccessful. In 1936, however, the specimens collected from this area were determined to be R. frustrana bushnelli (Busk) and R. neomexicana (Dyar).

Reproduction in the infested area is very dense. It has become considerably deformed and stunted from recent feeding by tip moth. Some mortality of young trees appears to be imminent if the infestation continues unchecked.

Associated with the Rhyacionia infestation are minor populations of three other insects: Choristoneura lambertianae (Busck), a gelechiid, and the jack pine needle miner, Zelleria haimbachi Busck.

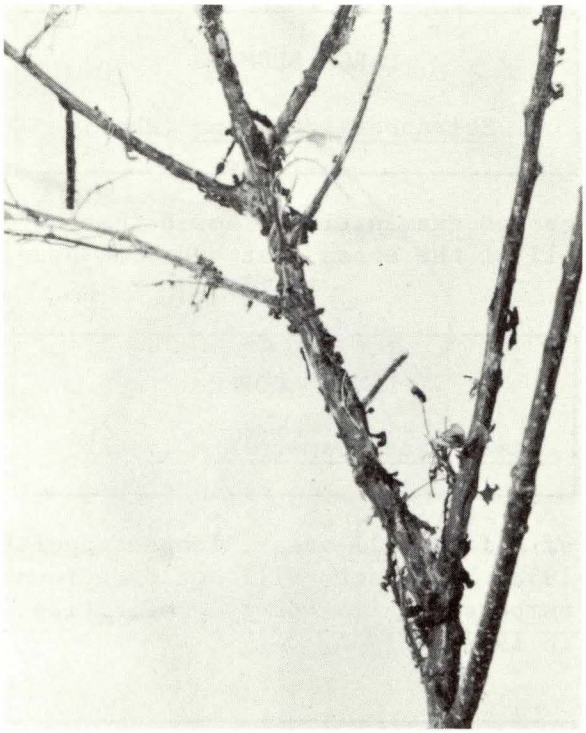
BARK MOTH OF DOUGLAS-FIR

Laspeyresia fletcherana Kearf.

A relatively new pest of Douglas-fir reproduction was reported by the Missoula Laboratory. Larvae of a moth caused some damage to Douglas-fir Christmas tree stock by boring in the bark of boles and limbs. Boring does not penetrate the cambium layer of any except the smallest seedlings. Seedlings as small as 15 inches in height have been attacked. In small trees the insect has caused some top killing in the infestation area on the Rexford Ranger District in the Kootenai National Forest, Montana. Except for the possibility of damage to small seedlings, the pest is not believed to be economically important.

TENT CATERPILLARS

Populations of the forest tent caterpillar, Malacosoma disstria Hbn., are prevalent in the northern Rockies for the first time in four seasons and appear to be increasing in Missoula County, Montana. Scattered infestations of Great Basin tent caterpillar, M. fragilis Stretch, were observed occasionally west of the Continental Divide in Montana but appear to be more numerous east of the divide on a variety of shrubs, mainly Prunus, but also Rosa, Amelanchier, and rarely Ribes. Caterpillar populations in the vicinity of Bozeman, Montana, were strongly parasitized by ichneumonids which pupated within the skin of the half-grown host; most other caterpillars died, possibly of disease, before pupating. Tent caterpillars have not been collected recently in Montana in Populus, Salix, or Acer.



Numerous dead larvae of tent caterpillar on defoliated branches showed symptoms of disease

Tent caterpillars were abundant throughout most of the Intermountain area in 1958. One of the more serious outbreaks occurred on the Cache National Forest along the Wasatch front facing the heavily populated Salt Lake valley. Mountain maple, chokecherry, and several browse plants were the most heavily attacked. A virus disease attacked the mature larvae in this outbreak and succeeded in killing a very high percentage of the population before pupation occurred. Some local centers may develop next year, but they probably will be controlled by the virus disease. The forest tent caterpillar, Malacosoma disstria Hbn., was most prevalent, but the Great Basin tent caterpillar, M. fragilis Stretch was also present.

LARCH CASEBEARER

Coleophora laricella (Hbn.)

A severe infestation of this insect was discovered in 1957 in the vicinity of St. Maries, Idaho. This infestation was the first recorded western appearance of this forest defoliator. At that time visible defoliation extended over an area of 15,000 acres of western larch stands. A detection survey in 1958 showed that the

casebearer is now present over 110 square miles in northern Idaho and northeastern Washington. Although no visible defoliation was observed outside the 15,000 acres reported in 1957, the casebearer was found in small numbers as far north as Sandpoint, Idaho, and Chewelah, Washington. No southern expansion of the infestation was found beyond Clarkia, Idaho.

LARCH BUDMOTH

Zeiraphera griseana (Hbn.)

A 3-year-old outbreak of larch budmoth ended in 1958. No visible defoliation by this insect could be detected during aerial surveys, and ground examinations showed that the budmoth has practically disappeared in all of the areas that had been heavily infested in 1957.

LARCH LOOPER

Semiothisa sexmaculata (Pack.)

Since 1955 this geometrid has been the most widespread defoliator of western larch in the northern Rockies. However, with the exception of a few small areas, looper populations have remained at a low level. In 1958 the insect still could be found throughout the region, but only in small numbers even in the few localities where measurable populations were observed in 1957.

LARCH SAWFLIES

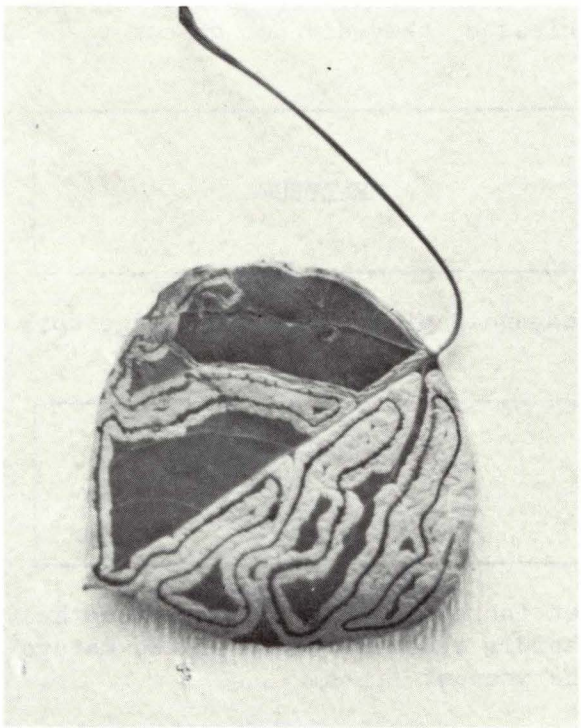
Pristiphora erichsonii (Hartig)

In July an infestation of the larch sawfly was discovered in Missoula County, Montana. This is the first time this species has been observed in the northern Rocky Mountains since 1944. Visible defoliation extended over several square miles of scattered sapling- and pole-sized western larch stands near the junction of the Clearwater and Blackfoot Rivers. Heavy defoliation was observed in individual drainages, where trees were completely stripped of needles. By August 1, most current year's feeding was completed and the larvae were pupating. Counts of pupae varied from 40 to 60 per square foot of duff in an area of heavy defoliation. For the past several years two sawflies--the two-lined (Anoplonyx occidens Ross) and the western A. laricivorus Roh. & Midd.)--frequently have been found associated with the larch looper, Semiothisa sexmaculata (Pack.), in larch stands of western Montana, northern Idaho, and northeastern Washington. Field observations indicate that both sawfly species have two generations per year in this region, but their numbers in 1958 were too few to cause visible defoliation of larch.

ASPEN LEAF MINER

Phyllocnistis populiella Chamb.

The aspen leaf miner has been in epidemic status for about 10 years on four national forests in western Wyoming and southeastern Idaho. The infestation is still very active, and this year, as in the past, nearly 100 percent of the foliage of all aspen trees within the infestation was heavily mined. On the Teton National Forest much of the foliage has been stunted by continuous feeding. Many patches of dead aspen, ranging in size up to 10 acres, are scattered throughout the infestation and it is now felt that most of the mortality resulted from repeated heavy feeding by the leaf miner.



Typical leaf damage by larvae of aspen leaf miner

SUCKING INSECTS

WHITE PINE APHID

Pineus coloradensis Gill.

In 1958 a survey was begun to determine the extent to which an aphid, tentatively determined as Pineus coloradensis Gill., is associated with crown deterioration of western white pine in the Inland Empire. For some years loss of 2- and 3-year-old needles in stands throughout the range of white pine has been serious. The deterioration has thus far been undetermined. In several areas mortality of trees in the younger age classes has become increasingly apparent. In 1958 this aphid was found widely dispersed throughout the range of white pine. An attempt has been made to determine whether the aphid is associated with crown deterioration, but this study has not progressed beyond the initial explorations.

PINE NEEDLE SCALE

Phenacaspis pinifoliae (Fitch)

Infestations of the pine needle scale were unusually abundant throughout the northern Rocky Mountain region on ornamental evergreens during 1958. The infestations were unusually widespread, and although plants were heavily infested, they did not appear to be serious.

MEALYBUG

An infestation of mealybug approximately 6,000 acres in extent was found on the Payette National Forest on true firs, white bark pine, spruce, and lodgepole pine. Present damage does not appear serious.

SPRUCE MEALYBUG

Puto sp.

The spruce mealybug infestation covering approximately 60,000 acres of spruce in southern Utah is still very active. The area of infestation did not increase in 1958. Continued heavy feeding within the infestation is rapidly reducing vigor of the mature spruce and is causing some deformity in the younger trees.

SPRUCE SPIDER MITE

Oligonychus ununguis (Jacobi)

Infestations of spruce spider mite persist in several national forests east of the Continental Divide in Montana. Surveys in 1958 showed that mite populations remained heaviest in those areas sprayed for budworm control in 1956-1957. Without exception, mite populations were insignificant in areas that had not been sprayed. Examination in areas showing heavy foliar injury in 1957 indicated that mite populations were rapidly declining and foliar injury in 1958 was greatly reduced.